U. S. FOREST PRODUCTS LABORATORY

MADISON, WISCONSIN.

LIST OF PUBLICATIONS JANUARY 1 TO JUNE 30, 1941

Publications available for distribution at the Laboratory are marked with an asterisk (*). Blanket requests for publications will not be filled. Publications not marked with an asterisk are available as noted after the title.

Trade journals and magazines referred to, if not available in your local library, may be obtained from publishers listed on the last page.

Chemistry of Wood and Derived Products

*Determination of nickel and copper chromates and nickel, copper, and magnesium arsenates in treated wood, by R. H. Baechler and Philip Servais. Forest Products Laboratory Mimeo. R1260, Mar. 1941.

Accurate methods have been developed for analyzing wood containing chromates and arsenates of nickel and copper and magnesium arsenate. Common procedures of analytical chemistry are utilized with some minor modifications which were found necessary.

*Internal surface of cellulosic materials, by A. J. Stamm & M. A. Millett. Jour. Phys. Chem., Jan. 1941; Mimeo. R1255.

The internal surface of the microscopically visible capillaries and of the transient cell-wall capillaries of cellulose and of wood have been calculated from microscopic measurements, adsorption of gases and vapors, selective adsorption from solution, heats of swelling and adhesion tension, and flow measurements.

*Reaction of methyl hypochlorite with lignin, by E. E. Harris & L. J. Lofdahl. Jour. Amer. Chem. Soc., Jan. 1941; Mimeo. R1254.

Lignin reacts with chlorine in methanol and with methyl hypochlorite to produce lignin derivatives containing methoxyl groups in excess of those in the starting material. The addition of these methoxyl groups indicates the presence of ethylenic groups in lignin.

Resistance to leaching and decay protection of various precipitates formed in wood by double diffusion, by R. H. Baechler. A.W.P.A. Proc. 1941.

Compounds of low solubility and high toxicity, such as chromates and arsenates of copper, and nickel and magnesium ammonium arsenate, may be deposited in green wood by successively steeping it in solutions of different salts. Blocks so treated and leached show high chemical retention and resistance to decay.

Coatings

*Fire-retardant paints containing borax. Forest Products Laboratory Tech. Note 249, Apr. 1941.
Contents indicated by title.

Fire-retardant, synthetic-resin paints, by A. Van Kleeck. News Edition, Amer. Chem. Soc., June 10, 1941.
Describes the fire-retardant properties of dicyandiamide-formaldehyde and ethylidene urea-formaldehyde resin preparations. The desirability for additional research to overcome certain objectionable features of these coatings is pointed out.

The right paint for your job, by F. L. Browne. Successful Farming, May 1941.
White paints available for farm buildings are chiefly pure white lead paint and the "TLZ" paints, containing titanium, white lead, and zinc oxide in widely varying proportions. Significance of variations in proportions is discussed. Includes suggestions for recognizing the general character of most paints from the label formulas. Red barn paints are also described.

*Two-coat system of house painting, by F. L. Browne. Forest Products Laboratory Mimeo. R1259. (To be published soon in Indus. & Engin. Chem.)
Reviews growth of two-coat initial painting system and presents results of Forest Products Laboratory two-coat initial painting studies. The durability of the paint job is governed by thickness of coating rather than number of coats. Presents equations for calculating coating thickness. Compares modern house paint primers and "self-priming."

Containers

*Corrugated board and its component parts as engineering materials, by T. A. Carlson. Amer. Management Assn., Prod. Ser. 128, 1941; abstracted in Packing & Shipping May 1941.
Reviews results of research on mechanical properties of sheet materials and the correlation of these properties with strength characteristics of corrugated fiberboard. Discusses progress made in translating these basic data into terms of box performance. Includes descriptions of tests and typical results.

*Factors affecting the compressive strength of fiber boxes, by T. A. Carlson. Fibre Containers, Mar. 1941; Paper Indus. & Paper World, May 1941; Paper Trade Jour., June 5, 1941; abstracted in Paper Mill & Wood Pulp News, Feb. 22, 1941.
The influence of depth of scoring and the part played by the different elements of a corrugated box in resisting crushing loads are discussed. Included are typical autographic load-compression curves from tests of filled and empty boxes and of box parts.

Laminated and Compressed Wood

*Compression of wood, by R. M. Seborg & A. J. Stamm. Mech. Engin., Mar. 1941; Mimeo. R1258.

Compressed wood tends to leave its compression on swelling. The higher the pressing temperature and the higher the moisture content of the wood, the smaller will be the recovery. Compressed wood should be made at a temperature of at least 300° F. and a moisture content of at least 12 percent.

*Resin-treated, laminated, compressed wood, by A. J. Stamm & R. M. Seborg. Forest Products Laboratory Mimeo. R1268, May 1941.

The treatment of wood with an unpolymerized water-soluble phenol-formaldehyde resin-forming mix permanently reduces the swelling and shrinking, and prior to curing plasticizes the wood greatly. This makes possible the manufacture of compressed wood under low pressures and combinations of compressed and uncompressed wood in a single operation.

Pathology

A blue stain fungus, Ceratostomella montium N. Sp., and some yeasts associated with two species of Dendroctonus, by Caroline Rumbold. Jour. Agr. Research, May 15, 1941.

The sapwood of Pinus contorta latifolia, P. monticola, P. ponderosa, and P. flexilis trees infested with the bark beetles Dendroctonus monticolae and D. ponderosae was stained by a new species of Ceratostomella. This fungus has large perithecia and box-shaped spores. It is sensitive to high temperatures and its growth is stimulated by two species of yeast, Zygosaccharomyces and Monilia.

*Effect of blue stain on specific gravity and strength of southern pine, by A. Dale Chapman & T. C. Scheffer. Jour. Agr. Research, July 15, 1940.

Controlled laboratory tests indicated that blue stain in naturally infected pine wood commonly may reduce specific gravity to 1 to 2 percent, strength in compression parallel to the grain and modulus of rupture 1 to 4 or 5 percent, toughness 15 to 30 percent, and surface hardness 2 to 10 percent.

*The effect of certain heart rot fungi on the specific gravity and strength of Sitka spruce and Douglas-fir, by T. C. Scheffer, T. R. C. Wilson, R. F. Luxford, and C. Hartley. U. S. Dept. Agr. Tech. Bul. 779, May 1941.

Gives comparative strengths of sound and decayed wood from standing trees infected by Polyporus schweinitzii and Fomes pini. Emphasis is placed on the relations of strength reduction to visible stages of decay and to the position of the wood with reference to the central zones of infection.

*Utilization of blue-stained lumber. Forest Products Laboratory Tech. Note 184, revised Apr. 1941.

Contents indicated by title.

Preservation

Comparison of preservatives in Mississippi Fence post study, by R. M. Wirka. A.W.P.A. Proc. 1941.

Describes a service test study in Mississippi in which posts are used as the testing medium to obtain information on the relative effectiveness of 23 preservatives and chemicals. Describes the condition of the various groups of posts after about 3 years service.

*Computed thermal conductivity of common woods. Forest Products Laboratory Tech. Note 248, Apr. 1941.

Contents indicated by title.

Fire-extinguishing effectiveness of chemicals in water solution, by H. D. Tyner. Indus. & Engin. Chem., Indus. Edition, Jan. 1941.

Presents the results of over 800 laboratory tests to study the fire-extinguishing effectiveness of aqueous solutions of 33 chemical compounds. Work was done in conjunction with field tests on chemical solutions for extinguishing forest fires.

*Fire tests show resistance of plywood wall units, by G. C. McNaughton & C. A. Harrison. Wood Construction, Apr. 15, 1941; Amer. Bldr. & Bldg. Age, June 1941; Mimeo. R1257.

Deals with the effects upon fire resistance of different glues used in the plywood, the thickness of the plywood faces, the forms of insulation between faces, and details of assembling.

Information obtained from marine piling experiments on the Gulf Coast, by J. D. MacLean. A.W.P.A. Proc. 1941.

Summarizes data obtained in tests to determine the relative effectiveness of different preservatives and treatments in protecting wood against marine borers.

International termite exposure test: 12th progress report, by G. M. Hunt & T. E. Snyder. A.W.P.A. Proc. 1941.

Presents results obtained to 1941 from wood specimens treated with various chemicals and exposed to termites and decay in Australia, Barro Colorado Island (Canal Zone), Hawaii, and South Africa.

*Making log cabins endure. Forest Products Laboratory Mimeo. R982, revised Feb. 1941.

Points out simple precautions that may be taken when building log cabins to insure long life.

*Memorandum -- The treatment of sawdust insulation for protection against decay, insects, animals, and fire. Forest Products Laboratory Mimeo. R1092, revised Jan. 1941.

Contents indicated by title.

Thermal conductivity of wood, by J. D. MacLean. Heating, Piping & Air Conditioning, June 1941.

Discusses the results of an extensive study of the subject. Includes formulas which make it possible to compute the approximate conductivity of any species of wood when the moisture content and the weight per unit volume or the density are known.

*Wood preservatives. Forest Products Laboratory Mimeo. R149, revised Apr. 1941.

Describes various chemical preservatives that may be used to protect wood against wood-destroying organisms.

Pulp and Paper

*List of reference works on pulp and paper. Forest Products Laboratory Mimeo. R564, revised May 1941.

Contents indicated by title.

*Some observations on the effect of alum on certain sheet properties of paper, by E. L. Keller, F. A. Simmonds, & P. K. Baird. TAPPI Tech. Papers, June 1940; Paper Trade Jour., Jan. 2, 1941.

Experiments with test sheets and machine-made paper indicated that as the bicarbonate content of fresh process water increased, thus necessitating an increase in the amount of alum to maintain a pH of 4.5, the amount of floc retained by the paper increased, resulting in a decrease in the paper strength.

Suitability of high-density, high-summerwood slash pine for kraft and high-grade papers, by S. L. Schwartz & M. W. Bray. South. Pulp & Paper Jour., Mar. 1941; abstracted in Paper Mill & Wood Pulp News, Feb. 22, 1941.

This variety of Florida slash pine produced coarse bulky kraft pulps lower in bursting, folding, and tensile strengths, but of higher resistance to tear than wood grown on more favorable sites in the southern yellow pine belt. Bleachable sulfate pulps were stronger than the less thoroughly cooked kraft pulps.

*Sulfate pulping of Douglas-fir: III - Effect of growth variables on yield and pulp quality, by M. W. Bray, S. L. Schwartz, & J. S. Martin. TAPPI Tech. Papers, June 1940.

Growth rate, position of bolt in the tree, and age of Douglas-fir affect both yield and quality of sulfate pulps. Young trees gave the highest yield of screened pulp, rapid growth gave the highest tearing strength. Burst and tensile strengths were highest in pulps from top bolts.

Seasoning of Wood

*The hygroscopic and antishrink values of chemicals in relation to chemical seasoning of wood, by E. C. Peck. Indus. & Engin. Chem., May 1941; Mimeo. R1270.

Discusses the hygroscopic and antishrink properties of a number of chemicals and mixtures of chemicals that might be used for the chemical seasoning of wood.

*Drying rates of blue-stained and bright lumber, by T. C. Scheffer. South. Lbrman., Mar. 15, 1941; Wood Products, Mar. 1941.

Blue-stained pine and sweetgum sapwood seasoned somewhat more rapidly than bright wood. Reported heavier shipping weights of stained wood are regarded as due to factors other than stain.

*The drying rate of sugar maple as affected by relative humidity and air velocity, by O. W. Torgeson. Forest Products Laboratory Mimeo. R1264, Dec. 1940.

In kiln drying green lumber, the amount of air circulation greatly affects the drying conditions at the wood surface. Under high humidities, the effect extends to velocities as high as 800 feet per minute. Other factors affecting the drying rate of lumber are also discussed.

*Function and calculation of ventilation in drying compartments, by O. W. Torgeson. Forest Products Laboratory Mimeo. R1265, Apr. 1941.

In kiln drying, ventilation should not be confused with circulation. Ordinarily, the needed ventilation is only a small part of the needed circulation rate. One method of calculating the amount of ventilation needed is given as an illustration.

*Simplifying the calculation of the quantity of air required in kiln drying lumber, by O. W. Torgeson. Forest Products Laboratory Mimeo. R1266, Apr. 1941.

A chart is presented which shows the amount of air and vapor necessary to evaporate 1 pound of water when the temperature drop across the load is 1 degree. Its use simplifies the calculation of either air circulation, drying rate, or temperature drop provided the other two factors are given.

*Technique of developing a drying process for small stock, by O. W. Torgeson. Forest Products Laboratory Mimeo. R1263, Sept. 1940.

The drying of small handle stock loosely piled in a crib to reduce handling cost is shown to be feasible from an air circulation standpoint. Air velocities and static pressure differences through loads of various sizes are given for several fan speeds.

*Why the drying time of a kiln load of lumber is affected by air velocity, by O. W. Torgeson. Forest Products Laboratory Mimeo. R1269, June 1941.

In kiln drying, decreases in the drying time of some green 1-inch red oak were obtained by increasing air velocity and by open piling. Results are attributed to turbulence of flow stratification, thus reducing the gradation of temperature and humidity across the air stream.

Wood in Construction

*Dimension panels in a modular system of small house construction. Forest Products Laboratory Mimeo. R1251; Amer. Bldr. & Bldg. Age, June 1941.

Describes by photographs a proposed system for small-house construction by which panels, prefabricated from cuttings from low-grade material, are used in connection with conventional framing erected on the site.

*Nailing dense hardwoods. Forest Products Laboratory Tech. Note 247, Apr. 1941.

Contents indicated by title.

Evolution of home construction, by R. P. A. Johnson. Soc. Residential Appraisers Review, Apr. 1941.

A description of the work of the Forest Products Laboratory that bears on the use of wood in house construction. It covers control of decay, moisture, condensation, and fire, the cause of paint troubles, the misuse of wood in construction, and the prefabricated wood house developed at the Laboratory.

Nailing hardwoods, by R. P. A. Johnson. Amer. Lbrman., Apr. 5, 1941.

Classifies hardwood species into groups in accordance with the ease with which they can be nailed. Describes the methods used in nailing the refractory hardwoods.

*The rigidity and strength of braced and unbraced walls covered with bevel siding, by E. C. O. Erickson. Forest Products Laboratory Mimeo. R1261, Apr. 1941.

Summarizes results of racking tests of wall frames covered with 6-inch and 8-inch western redcedar bevel siding applied directly to the studs (no sheathing). Compares the results with tests of uncovered braced frames and of braced and unbraced frames covered with horizontal sheathing of a dense softwood.

Wood frame buildings, by F. J. Champion. Chem. & Metall. Engin., May 1941.

A brief summary of recent developments in wood frame construction that lend themselves to emergency expansion of industrial manufacturing facilities.

Wood Structure

Collapse in wood as shown by the microscope, by H. D. Tiemann. Jour. Forestry, Mar. 1941.

Photomicrographs of identical wood cells in collapsed and restored conditions which are directly comparable. Proof that cause of collapse is internal tension of the liquid phase and not external pressure. New method of preparing the sections by dry polishing.

New method of detecting compression wood, by M. Y. Pillow. Jour. Forestry, Apr. 1941.

The method of detecting compression wood by its opacity to transmitted light is rapid, convenient, and accurate within practical limits in the selection of construction and experimental material or for determining whether compression wood was the cause of unexpected behavior in service, provided thin cross sections can be sawed from pieces in question.

Remarkable spiral arrangement of fibrils in the cell walls of *Nerine fothergilli*, by H. D. Tiemann. Lilloa, 1940.

By pulling leaves apart longitudinally, walls of vessels unwind like spiral springs, yielding a spiderweb-like fabric consisting of individual uniform fibrils 2 microns diameter, appearing as cellulose in polarized light. Suggests that these are unit fibrils composing all plant cell walls, including wood.

Wood Utilization, Logging, and Milling

*Something new in hardwood log grades, by A. O. Benson. Jour. Forestry, Jan. 1941; Mimeo. R1271.

Discusses in generalities a proposal to inaugurate a method of grading hardwood logs that departs widely from current practice. Based on exploratory field work it proposes that logs, like lumber, be graded according to the amount of clear cutting surface area instead of number and size of defects.

*Wood flour (a general statement of manufacture and use of wood flour and the status of the industry). Forest Products Laboratory Mimeo. R565, revised 1941.

Deals with the general character of the material, production and value, properties, species used, types of product, and manufacturing processes. Also covered are uses for wood flour, status of the industry, and references to articles on wood flour subjects.

Miscellaneous

Comment on Prof. W. Kynoch's article, "A long-time plan for increasing the value of wood as an industrial material," by F. J. Champion. Jour. Forestry, Jan. 1941.

Agreeing with Prof. Kynoch's main thesis that the forest economy of America needs more technicians trained in wood utilization, but maintaining that the United States has made marked technological improvements in wood use independent of European progress.

*Importance of forest products in national defense, by C. P. Winslow. Jour. Forestry, Feb. 1941; Mimeo. R1250.

Contents indicated by title.

*Kiln design and development of schedules for extracting seed from cones, by R. C. Rietz. U. S. Dept. Agr. Tech. Bul. 773, May 1941.

Steam-heated dry kilns having forced-air circulation and temperature control were designed and used for efficiently drying relatively moist cones without danger of seed injury. Constant temperature drying schedules were developed for longleaf, eastern white, red, and jack pine cones.

*Molding wood to man's will: New plasticizing treatment may open way to use of low-quality timber, by F. J. Champion. Amer. Forests, Apr. 1941.

A popular description of the discovery of urea plasticization of wood and of the properties of the new material.

*Treating spruce and balsam fir Christmas trees to reduce fire hazard. Forest Products Laboratory Tech. Note 250, Apr. 1941.

Contents indicated by title.

Publishers of Trade Journals and Magazines Included in References

Amer. Bldr. & Bldg. Age, 105 W. Adams St., Chicago, Ill.
Amer. Chem. Society, 1155 - 16th St., NW., Washington, D. C.
Amer. Forests, 919 - 17th St., NW., Washington, D. C.
Amer. Lbrman., 431 S. Dearborn St., Chicago, Ill.
Amer. Management Assn., 330 W. 42nd St., New York City.
AWPA (Amer.Wood-Preservers' Assn.), 1427 Eye St., NW., Washington, D. C.
Chemical & Metallurgical Engineering, 330 W. 42nd St., New York City.
Fibre Containers, 228 N. LaSalle St., Chicago, Ill.
Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago, Ill.
Indus. & Engin. Chem., Mills Bldg., Washington, D. C.
Jour. of Agricultural Research, Govt. Printing Office, Washington, D. C.
Jour. Amer. Chemical Society, 12 Oxford St., Cambridge, Mass.
Jour. Forestry, Mills Bldg., Washington, D. C.
Jour. Physical Chemistry, Mount Royal & Guilford Aves., Baltimore, Md.
Lilloa, Revista de Botanica, Universidad Nacional de Tucuman, Tucuman, R., Argentina.
Mechanical Engineering, 29 W. 39th St., New York City.
Packing & Shipping, 30 Church St., New York City.
Paper Indus. & Paper World, 59 E. Van Buren St., Chicago, Ill.
Paper Mill & Wood Pulp News, 1440 Broadway, New York City.
Paper Trade Jour., 15 W. 47th St., New York City.
Society of Residential Appraisers Review, 221 N. LaSalle St., Chicago, Ill.
South. Lbrman., 917 Berryhill St., Nashville, Tenn.
South. Pulp & Paper Jour., Mortgage Guarantee Bldg., Atlanta, Ga.
Successful Farming, 1714 Locust St., Des Moines, Iowa.
TAPPI (Tech. Assn. of the Pulp & Paper Industry), 122 E. 42nd St., New York City.
Wood Construction, Green & Market Sts., Xenia, Ohio.
Wood Products, 431 S. Dearborn St., Chicago, Ill.